

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON GENERA OF PANICEAE. I.

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One of the chief distinguishing characters of this tribe of grasses is the single fruit, composed of the more or less indurated lemma and palea, the latter firmly clasped by the margins of the lemma (rarely loose, as in *Leptocoryphium* and *Hymenachne*), enclosing the free grain. This simple arrangement is variously modified in the different genera. After several years' study of the fruits of this tribe the writer proposes to offer this and subsequent papers on the genera with special reference to the fruits, figuring and describing the fruit of the type species of each genus.

It may be well to state why the character of the fruit is held to have superior generic value. It is because: 1. The character of the fruit is constant in the same species. The first glume may be present or obsolete in *Paspalum distichum* L., *P. Drummondii* Vasey, *P. bifidum* (Bertol.) Nash, and in a few others, not only in the same species but in the same specimen, but within are always the same plano-convex, chartaceous-indurated fruits, the lemma with inrolled margins, the palea included at the apex as well as on the margins; *Reimaria oligostachya* Munro may lack but one instead of both glumes but the fruit remains constant; *Echinochloa crus-galli* (L.) Beauv. may have very long awns or be mucronate only, but the fruit will have the characteristic abruptly acuminate apex, the palea free at the summit. 2. The fruit with but slight modifications is constant for greater or smaller groups of similar species; that is, taking the fruit as a generic character it assembles species which show other resemblances, and does not arbitrarily assemble those which show no close affinity, as does the character of the presence of the first glume in *Paspalum*, which places in *Dimorphostachys*, founded on *Paspalum monostachyum* H. B. K., such diverse species as *P. Drummondii* Vasey and *P. Schaffneri* Fourn., when both have



nearer relatives left in the genus *Paspalum*. The foregoing does not mean that the fruit is held to be the only generic character but merely that it is a strong one which has not received the attention it deserves; while it is held that any generic character must be constant in a species and assemble species having other affinities. Such a character is the reversed position of the spikelets in *Axonopus* Beauv. (*Anastrophus* Schlecht.). The fruits alone would not separate this genus from *Paspalum*, but not one of the many specimens of the several species examined shows a spikelet placed otherwise than with the back of the fruit turned from the rachis.

These studies are based on the material in the National Herbarium where all the genera of this tribe are represented, most of them by a large series of specimens. The figures* and descriptions are drawn from mature or nearly mature fruits; since the spikelets fall at maturity it is difficult to find perfectly ripe fruit in herbarium specimens.

The present paper is confined to that group of Paniceae in which the fruits are cartilaginous-indurated (not rigid) papillose, and usually dark colored; lemmas and paleas alike in texture, the lemmas with more or less prominent, white, hyaline margins not inrolled.

KEY.

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|---|-----------------------|
| Lemma boat-shaped, margin narrow | <i>Anthraenantia</i> |
| Lemma convex only. | |
| Palea not inclosed above, lemma hyaline at the summit. | <i>Leptocoryphium</i> |
| Palea inclosed, lemma with broad hyaline margin nearly to the base. | |
| Fruit lanceolate-acuminate, second glume and sterile lemma clothed with long hairs exceeding the spikelet, grain unequally biconvex | <i>Valota</i> |
| Fruit elliptic; second glume and sterile lemma clothed with short hairs or nearly glabrous, grain planoconvex in section. | |
| Spikelets disposed in 1-sided racemes which are digitate or racemose | <i>Syntherisma</i> |
| Spikelets in panicles divergent at maturity | <i>Leptoloma</i> |

GENUS ANTHAENANTIA Beauv. 1812. Agros. 48. t. 10. f. 7.

Axis paniculatus: Panicula subsimplex.—Glumæ *subaequales*, concave, herbaceae.—FLOSC. INFER. neut.: Paleæ membranaceae, *oppositæ*, *Paleis*

* The figures are all magnified 20 diameters.

hermaphroditis contrariè dispositæ.—FLOSC. SUPER. hermaph. : Paleæ subcartilagineæ.—SPEC. *Phalaris villosa* MICH.

Phalaris ? villosa Michx. 1803. Fl. Bor. Am. 1 : 43. "HAB. in sylvis sabulosis Carolinæ."

Just what is meant by the paleae of the neuter floret placed contrariwise to those of the perfect floret it is difficult to decide. The figure shows such an empty floret consisting of a small lemma and palea placed laterally against the palea of the fruit. Kunth (Rev. Gram. 1 : 217) reducing the genus to *Panicum* with the specific name of *ignoratum*, remarks that "Beauvois who never soaked the spikelets before examining them nor used a needle to open them" mistook the torn margins of the sterile lemma for a 2-valved floret.

Aulaxanthus Ell. 1816. Bot. S. C. & Ga. 1 : 102.

"Flores paniculati. Calyx 2-valvis, 1-floris; valvis æqualibus, sulcatis Corolla 2-valvis, subaequalis."



Two species, *A. ciliatus* and *rufus* are described, and "*Phalaris villosa ? Michx.*" is given under the first. Though the generic description says the spikelets are 1-flowered, under *ciliatus* is stated : "at the back of the interior valve occurs a neutral floret, 1-valved, ovate, 2-cleft, green."

Aulaxia Nutt. 1818. Gen. 1 : 47. Description is nearly identical with that of Elliott, "1-flowered, with the rudiment of a second" added; *Aulaxanthus* is given as synonym; no reason is assigned for changing the name.

These three generic names are founded on the same species.

Description.—Spikelets in narrow panicles, obovoid, first glume obsolete, second glume and sterile lemma subequal, very broad, with 5 strong nerves, the very thin internerves deeply folded and densely clothed with long hairs, the sterile lemma enclosing a small palea and sometimes a staminate flower; fruit as long as the glume, plano-convex, subacute, chestnut brown, the lemma boat-shaped, the 3 nerves visible; the white or pale margins very narrow; palea unfolded its entire length, the 2 nerves visible; grain in section plano-convex.

GENUS LEPTOCORYPHIUM NEES. 1829. AGROS. BRAS. 83.

Calyx uniglumis, biflorus, gluma inferiore, deficiente. Flosculus inferior neuter, uniglumis * * * Flosculus superior hermaphoditus, calycis longitudine, in fructu persistens chartaceus (nec induratus), valvulis attenuatis apice membranaceo-hyalinis lacero-ciliatis. [Whence the name from "*λεπτός tenuis* et *κορυφή apex*."]

The first species under this genus is *L. lanatum* (H. B. K.) Nees, based on *Paspalum lanatum* H. B. K. 1815. Gen. Pl. et Sp. 1 : 94. t. 29. "Crescit in regno Mexicano prope Venta del Cameron et Alto del Peregrino."

Roemer & Schultes (1817. Syst. Veg. 2 : 322) transfer this species to *Milium*, in which disposition of it they are followed by Kunth (1829. Rev.

Gram. 497), and Trinius (1834. Mem. Acad. St. Petersburg. VI. 3² : 121). Bentham (1881. Journ. Linn. Soc. Bot. 19 : 39) transfers it to *Anthaenantia* stating: "From these [N. Am. *Anthaenantia*] I can not separate generically the South American *Leptocoryphium* Nees, which besides some slight specific characters only differs from the North American species in the second glume being constantly, instead of occasionally only, empty." Hemsley (1885. Biol. Cent. Am. Bot. 3 : 483) follows Bentham; Fournier (1881. Mex. Pl. 2 : 13) upholds *Leptocoryphium*.

Description.—Spikelets in narrow panicles, lanceolate; first glume obsolete; second glume and sterile lemma 3 and 5 nerved, the internerves, which are not broad and infolded (or plaited) as in *Anthaenantia*, each with a row of long coarse hairs arising from tubercles (the tubercles sometimes obscure), the second glume shorter than the sterile lemma which equals the fruit and which is empty; fertile lemma slightly cartilaginous-indurated, minutely papillose (the papillae finer than in any of the other genera), chestnut with a white, delicately hyaline, summit, lacerate and often sparingly ciliate, a narrow hyaline margin extending down the sides to about the middle; on the back near the base is a small impressed area thin and white; palea with summit and margins like those of the lemma, not enclosed above, the 2 nerves obscurely visible; grain oblong-elliptic, in section plano-convex.



As shown by the fruit this seems to be, as Nees considered it, most nearly allied to *Valota* (*Trichachne* Nees) from which he separated it chiefly on the absence of the first glume. The inflorescence is like that of *Anthaenantia*, which it resembles also in lacking the first glume, but differs from in lacking the neuter palea or staminate flower and in the convex, not boat-shaped, lemma with a broad hyaline summit. It differs from both *Valota* and *Anthaenantia* in the fruit open at maturity. (A large number of specimens were examined and none in or past bloom were found closed.) Since this species fits so poorly in any other genus it seems wisest to maintain the one Nees established for it. Nees' single other species of *Leptocoryphium* we have not seen.

GENUS VALOTA ADANS. 1763. FAM. PL. 2 : 495.

Gramen. Avenae. Sloan. t. 14. f. 2. Couronne de la gaine des feuilles : Membrane médiocre. Fleurs : Panicule étagée. Calice : Ovoïde, sans arêtes, à 3 bales velues. Corolle : Sans arêtes.

The reference to Sloane serves to identify the genus, which the very insufficient description would not do, and fixes its identity with *Andropogon insulare* L.

Andropogon insulare L. 1759. Pugill. Jam. 30; and Sp. Pl. Ed. 2. 1763. 2 : 1480. In the Pugillus no citation is given; in the Species Plantarum

the previous publication by Linnaeus is cited, and also Brown Jam. 365, and Sloane, 1 : 43. t. 14. f. 2. "Hab. in Jamaica."

Brown (l. c.) after his polynomial cites Sloane t. 14.

Sloane's figure (l. c.) is an excellent representation of the upper portion of the plant, a leaf and overmature panicle.

Panicum lanatum Rottb. 1776. Descr. Pl. 3. Based on *Andropogon insulare* L.; the same reference to Sloane is also given. Here follows the first adequate description of the species, even the fruit being described: "*Corollæ valvæ 2 lanceolatæ, concavæ, acutissimæ, membranaceæ.*"

Milium villosum Sw. 1788. Prod. 24. Based on *Andropogon insulare* L.

Beauvois 1812. Agros. 150, in the index refers *Andropogon insularis* to *Monachne*, but this species is not mentioned under that genus on p. 49.

Panicum leucophoemum H. B. K. 1815. Nov. Gen. et Sp. 1 : 97. Based on *Andropogon insulare* L. This species and *P. adscendens* H. B. K., which is *Syntherisma sanguinalis* or a close ally, are placed together under "3) Spicis verticillatis, fasciculatis aut paniculatis (Digitariæ plurimæ)."

Panicum insulare Meyer. 1818. Prim. Fl. Esseq. 60. Based on *Andropogon insulare* L. The "valves of the corolla" are given as coriaceous with membranaceous margins.

Acicarpa Raddi. 1823. Agros. Bras. 31. with one species *A. sacchariflora* Raddi l. c. t. 1. f. 4. This is given on the authority of Nees. We have not seen the original publication.

Trichachne Nees. 1829. Agros. Bras. 85.

(*a θπιξ capillus et δχρη γλума.*)

Calyx bivalvis, subbiflorus, gluma inferiore minuta. Flosculus inferior univalvis vel bivalvis hirsutus, neuter; superior hermaphroditus, valvulis membranaceis mucronatis Caryopsis flosculi valvulis membranaceis vestita

* * * Inflorescentia : racemi elongati, simplices, unilaterales, verticillatim paniculati. Spiculae geminae ternaeve, altera brevius pedicellata.

* * * Flosculus hermaphroditus * * * bivalvis, glaber, membranaceus, valvulis lanceolatis in mucronum subulatum attenuatis ad fructum persistentibus membranaceo-chartaceis caryopsin tegentibus neque cum eadem induratis. * * * Differt a Panico praesertim gluma flosculi hermaphroditum, * * * at minime crustaceo seu cartilagineo indurato sed semper flexili.

Acicarpa Raddi 1823. Agros. Bras. 31. t. 1. f. 4. is cited as synonym and a note of explanation added that the name is expunged because of its similarity to *Acicarpa* Juss. [1803]. Nees' first species is *Trichachne insularis* (L.) Nees, based on *Andropogon insulare* L. Five other species are included, *T. sacchariflora* (Raddi) Nees, and four new species from Brazil, *T. recalva*, *tenuis*, *velutina*, and *ferruginea*, the last two of which Nees says he saw in the Royal herbarium at Berlin.

Grisebach (1864. Fl. Br. W. I. 557) places *Panicum insulare* and *P. saccharatum* Buckl. in *Tricholaena*; Stapf (1898, in Fl. Cap. 7 : 382) transfers "*Panicum leucophaea* Sw." to *Digitaria*, remarking, "the structure of the spikelets is * * * as in *Digitaria*." Stapf probably means *P. leucophoemum* H. B. K., which is a typonym of *A. insulare* L. Swartz did not publish the name given by Stapf. Millspaugh and Chase (1903, Fl. Yucatan,

Field Col. Mus. Bot. 3 : 23) transfer *T. insularis* to *Syntherisma*, remarking : "That this species belongs in the genus *Syntherisma* rather than in *Panicum* is shown chiefly by the fruiting glumes which are of the form characteristic of the former, having a floral glume with hyaline margins not inrolled."



Description.—Spikelets in pairs, short-pedicel in 2 rows along one side of a narrow rachis, the slender racemes erect or nearly so, solitary or fascicled along a common axis forming a narrow panicle; spikelets lanceolate, first glume minute, glabrous, the second and sterile lemma usually as long as the fruit or longer, 3-5 nerved, copiously clothed with long silky hairs (in one species, only, the silky hairs are not long and dense); fruit lanceolate, usually brown, the flat, white, hyaline margins broad; grain ellipsoid, in section unequally biconvex.

This genus is very closely allied to *Syntherisma* Walt. One species, *Panicum Pittieri* Hack., has the inflorescence of *Valota*, but the hairs on the second glume and sterile lemma are not long and copious, and the second glume is shorter than the fertile lemma as in some *Syntherismas*.

But considering the diverse aspect of the two genera as a whole it seems wisest to regard them as distinct.

The following species are transferred to this genus :

***Valota insularis* (L.)**

Andropogon insulare L. 1859. Pugill. Jam. 30.

***Valota saccharatum* (Buckl.)**

Panicum lachnanthum Torr. 1856. Pac. Rail. Rep. 7³ : 21, not Hochst. 1855.

Panicum saccharatum Buckl. 1866. Prel. Rep. Geol. & Agr. Surv. Tex. App. 2. "Middle Texas."

Trichachne saccharatum (Buckl.) Nash. 1903 in Small Fl. So. U. S. 83.

***Valota Pittieri* (Hack.)**

Panicum Pittieri Hack. 1901. Oest. Bot. Zeitsc. 51 : 367. "Costarica: in ripa rivi Rio Tirili prope San José leg. Tonduz: Pittier distribuit sub nro. 6945."

The species represented in American herbaria by Nealley's Texas collections and passing under the name *Panicum tenerrimum* Kunth, (based on *Trichachne tenuis* Nees) does not well agree with Nees' description. Since authentic specimens of this and Nees' other Brazilian species have not yet been seen, his species and the Texas form are left for future study; and to avoid the possibility of making unnecessary combinations by taking up possible synonyms these species and an Australian one with stramineous fruits are not here transferred to this genus.

GENUS SYNThERISMA WALT. 1788. FL. CAROL. 76.

Digitaria Haller 1768. Stirp. Helv. 2 : 244 not Adans. 1763, nor Heist. 1759, though Haller gives Heister and Adanson as authors of his *Digitaria*; but his description, though he evidently makes an effort to harmonize it

with those of Heister and Adanson by emphasizing the "excavations" of the rachis, applies not to *Tripsacum* but to the grasses so long known as *Digitaria*, and his pre-Linnaean references lead to *P. sanguinale* L.

Antiquum nomen, & characteristicum, reddo plantis nostris, quæ adeo vehementer a LINNÆUS *Panicis* abludunt, ut nullo modo eo referri possint. Receptaculum Tritici, alternis scrobibus excavatum. Ad eas scrobes applicantur flosculi petiolati. Calyx biglumis, lineatus, altera gluma parva, mucronata, altera majori faciei floris respondente, lineata: ita mucronata, compressa, ovato lanceolata uniflora, locusta oritur. Flos durus, nitens, siccus, convexus inde, hinc complanatus, & linea quasi divisus, non tamen penetrante. Nonquam satis potui distinguere divisionem in duas glumas. In cavea certe undique clausa semen sedet, compressum, planum.

Under his first species, to which Haller, who evidently opposed such an innovation as a binomial system, applies a polynomial, "LINN. p. 84" is cited, with Linnaeus' description of *P. sanguinale* used as a polynomial, the name *sanguinale* being omitted. The reference is to the 1762 edition of *Species Plantarum*. For discussion of *Digitaria* Heister see Hitchcock, Bot. Gaz. 38 : 298, and Nash, Bul. Torr. Bot. Club 25 : 289.

Panicum sanguinale L. 1753. Sp. Pl. 57. "Spicis aggregatis, basi interiore nodosis, flosculis geminis muticis, vaginis foliorum punctatis. * * * Habitat in America, Europe australi."

The specimen under this name in the Linnaean herbarium is the traditional *P. sanguinale* fide Prof. A. S. Hitchcock who has seen it. The first reference after the description is to Royen Fl. Leyden 55, where, after the polynomial quoted by Linnaeus, Sloan. Hist. 1 : 113, t. 70, f. 3 is cited. The second reference is to Gron. Virg. 154 [error for 134]. Gronovius refers to Clayton n. 457. Linnaeus' reference (Sp. Pl. 57) to Sloane 1 : 113 t. 70 f. 2 is evidently an error. The polynomial and figure cited in Royen applies to *P. sanguinale*.

Syntherisma Walt. 1788. Fl. Carol. 76.

Cal. 1-florus, 2-valvis: valvulis planis, acutis interiore minore recta, exteriori lateribus corollae subamplexante. Cor. 2-valvis: valvulis magnitudine et figura valvulae majori calycis simillimis. * * * Semen unicum, calyce corollaque persistentibus vestitum.

The first species is *S. præcox* Walt. "No specimen in [Walter's] herbarium. There is not much doubt but this refers to *Panicum sanguinale* L. (*Digitaria sanguinalis*), as stated by Elliott and Michaux." Hitchcock, Sixteenth Ann. Rept. Mo. Bot. Gard. 44.

Michaux (1803. Fl. Bor. Am. 1 : 45) includes *Syntherisma præcox* Walt. as synonym under *Digitaria sanguinalis* Scop.

This group has been held to be a genus or reduced to a section of *Panicum* according, seemingly, to the weight given its form of inflorescence. Nees, while noting the less indurated and "always pliable" lemma of *Trichachne*, does not seem to have noted that the same is true of the group he placed as section *Digitariae* of *Panicum*, nor that the differences from *Panicum* which he points out for *Trichachne* do not separate that genus from his section *Digitariae*. The form of inflorescence does not clearly distinguish this genus from *Panicum*, since the species known as *Panicum Perrotteti*

Kunth (*Paspalum Perrotteti* Hook f.) and its close allies have sparingly branched racemes more or less naked at the base forming a panicle not greatly unlike that of *Panicum proliferum* and yet are true *Syntherismas* as shown by the spikelets and especially by the cartilaginous-papillose lemma with flat, hyaline margins. Hooker f. (1896 Fl. Br. Ind. 7 : 10) places these and other species of Section *Digitaria* in *Paspalum*, saying "As above defined, *Paspalum* includes the *Digitaria* section of *Panicum*, which appears to me to be artificially placed in the latter genus, because of the occasional presence of a very minute scale-like glume at the base of what is the 3rd gl. of *Panicum* (that opposite the flg.). This minute glume which is present or absent even in the same species, is nerveless and never embraces that above it, as the lowest glume always does* in *Panicum* proper." The first glume is not only present or absent in the same species in *Syntherisma*, but sometimes in the same specimens, as in those of *P. Perrotteti* in the National Herbarium. Nash (Bul. Torr. Bot. Club 25 : 289) while contending that



Syntherisma is as worthy of generic rank as are *Paspalum*, *Anthænantia*, *Eriochloa*, *Isachne*, *Ichnanthus*, and *Tricholaena* fails to point out why it is so, and adds: "Our own view is that *Syntherisma* is more nearly related to *Paspalum* than to *Panicum*, and if its union with either genus were desirable it would certainly be with the former and not with the latter." If the cartilaginous-papillose lemma with flat hyaline margins be taken for the chief generic character, *Syntherisma* is at once clearly distinguished from both *Panicum* and *Paspalum*, with no intermediate species.

Description.—Spikelets solitary or in 2's or 3's, subsessile or short-pedicelled, alternate in 2 rows on one side of a 3-angled winged or wingless rachis, the slender racemes usually more or less spreading, usually digitate or in approximate fascicles at the summit of the culm, rarely distributed along the axis; spikelets lanceolate or elliptic; first glume minute or wanting, the second glume equalling the sterile lemma or shorter, fruit lanceolate or elliptic, the flat, hyaline margins white or pale; grain sub-elliptic, in section plano-convex or slightly concavo-convex.

The affinities of *Syntherisma* are with *Valota* on the one hand and *Anthænantia* on the other. To the former it is allied through *V. Pittieri* and the species mentioned above as "*Panicum tenerrimum*" from Texas. *Syntherisma* approaches *Anthænantia* through *Panicum* (§ *Digitaria*) *adustum* Nees and *Anthænantia Hackeli* Arech. allied species, and *Panicum badium* Scribn. & Merr., which are placed in *Syntherisma* rather than in *Anthænantia* on the following characters: Spikelets in pairs in 2 rows along one side of a triangular rachis; a minute first glume present (though this has little weight); second glume not equalling the sterile lemma (which is empty or contains only a nerveless rudiment of a palea), neither of them broad with deeply folded internerves as in *Anthænantia*; lemma not boat-shaped, the hyaline margins broad. In addition to the species con-

* Hooker was probably not acquainted with the Dichotomous Panicums in which he first glume is often nerveless and seldom embraces the second.

sidered by Nash (l. c.) in his treatment of the genus the following are here transferred:

Syntherisma adusta (Nees)

Panicum adustum Nees. 1829. Agros. Bras. 101. "Habitat in Brasilia meridionali. (Sellow.)"

Syntherisma badia (Scribn. & Merr.)

Panicum (Syntherisma) badium Scribn. & Merr. 1901. U. S. Dept. Agr. Div. Agros. Bul. 24: 12. "Sierra de San Felipe, State of Oaxaca" 915 C. L. Smith.

Syntherisma Hackeli (Arech.)

Anthracantheria Hackeli Arech. 1894. Anal. Mus. Nac. Montevideo 2: 96, t. 5. *Figueira*, Uruguay.

Syntherisma velutina (DC.)

Milium velutinum DC. 1813. Cat. Hort. Monsp. 126. "Hab. in Mexico."

Paspalum? velutinum Kth. 1829. Rev. Gram. 1: 27.

Represented by *Pringle 6623* and *9565*.

Syntherisma Perrotteti (Kth.)

Panicum Perrotteti Kth. 1829. Rev. Gram. 2: 395. t. 3. "Crescit in Senegalia, prope Walo."

Syntherisma stenotaphroides (Nees)

Panicum (? Digitaria) stenotaphroides Nees 1854 in Steud. Syn. Pl. Glum. 1: 41. "Ins. Choin legit Cuming."

This and an allied species are peculiar in having a thickened rachis, the solitary spikelets sunken in the alternate notches.

Species as yet imperfectly understood are not here transferred.

GENUS LEPTOLOMA GEN. NOV.

Inflorescentia paniculata, panicula pauciflora, maturitate diffusa; spiculae 1-florae, fusiformae, solitariae, aut raro per paria, in pedicellis tenuibus triangularibus; gluma prima minuta aut deficiens, secunda 3-nervis; lemma neutrum 5-7 nerve; fructus ellipticus, acutus; lemma hermaphroditum cartilagineo-induratum, papillosum, marginibus delicatus hyalinas, planis; palea similis; caryopsis oblongo-elliptica lemmate paleaque inclusa, libera. Gramina perennia, caespitosa, ramosa, culmis fragilibus, laminis planis, ligulis membranaceis. Maturitate paniculae se dissipant et pervolvunt Panico capillari similes. Nomen ab *λεπτός delicatus* et *λωμα margo*.



Inflorescence a few-flowered panicle diffuse at maturity; spikelets 1-flowered, fusiform, solitary or rarely in 2's on slender triangular pedicels; first glume minute or obsolete, the second 3-nerved, nearly as long as the 5-7 nerved sterile lemma, a more or less prominent stripe of appressed silky hairs down the internodes and margins of each; sterile lemma empty or enclosing a minute nerveless rudimentary palae; fruit elliptic, acute, brown; fertile lemma cartilaginous-indurated papillose, with delicate hyaline flat margins, enclosing a palea of the same texture: styles long and delicate, stigmas plumose, the branches more long and slender than in *Panicum*, rather less so than in *Syntherisma*; grain oblong-elliptic, in section plano-convex; free within the closed lemma and palea. Tufted branching perennials with brittle culms, flat blades,

and membranaceous ligules. At maturity the panicles break away and roll like tumble-weeds. Name from λεπτός delicate and λῶμα border in reference to the hyaline margins of the fertile lemma.

Type.—*Panicum cognatum* Schultes.

Leptoloma cognata (Schultes.)

Panicum divergens Muhl. in Ell. 1816. Sk. Bot. 1 : 130. not H. B. K. 1815. Specimen in Elliott herbarium in College of Charleston.

Elliott gives "Muhl. Cat." without page as authority for this name; in Muhl. Cat. 9 (1813) *divergens* is a nomen nudum.

Panicum divergens Muhl. 1817. Gram. 120. "Habitat in Carolina." Specimen in the Muhlenberg herbarium in Philadelphia Academy of Natural Sciences, marked "Elliott 353." In the same folio with this is a specimen of *Panicum Philadelphicum* marked "M. 112b."

Panicum cognatum Schultes 1824. Mant. 2 : 235. Muhlenberg's description is copied and *P. divergens* Muhl. is cited as synonym, the name changed, doubtless, because of *P. divergens* H. B. K., though this older use of the name is not mentioned. Thus it is the second publication of *P. divergens* Muhl. (that in Muhl. Gram.) on which Schultes bases his *P. cognatum*. Hence the specimen in Muhlenberg's herbarium is the type.

Panicum autumnale Bosc. Spreng. 1825. Syst. 1 : 320.

This name as used by American authors is synonymous with above, but we have not seen Bosc's specimen. Sprengel (l. c.) places the description of *P. autumnale* next to that of *P. divergens* Muhl. The brief description would apply to any *Panicum* with an effuse capillary panicle. It was not known to Sprengel where the specimen came from; "Patria?" he adds to his description, and indicates he saw the specimen in the Willdenow herbarium.

The sheaths and blades of this species, especially the lower ones, are often papillose pubescent, commonly so in Western specimens, though the type is almost glabrous. Pringle 489, Chihuahua, Mexico, represents an extreme form with slightly larger spikelets, having densely silky-pubescent internerves, which would appear to be a distinct species except for the fact that the inter-grades are more numerous than the extreme form. This is the only species of this genus known in the northern hemisphere. Three or four species are found in Australia.

Leptoloma divaricatissima (R. Br.)

Panicum divaricatissimum R. Br. 1810. Prod. 192. Port Jackson, New Holland.

Leptoloma macratenum (Benth.)

Panicum macratenum Benth. 1878. Fl. Australia 7 : 468. "Queensland, Rockhampton, O'Shanesy."

Leptoloma coenicola (F. Muell.)

Panicum coenicolum F. Muell. 1855 in Trans. Vict. Inst. 45. Cudnaka, S. Australia, F. Mueller.

Panicum papposum R. Br. Prod. 192, and *P. nematostachyum* Bailey 1903 in Bot. Bul. Dept. Agr. Queensl. 16 : 2, of which we have not seen specimens, probably belong here. The former is *P. autumnale* F. Muell. Fragm. 8 : 196, not Bosc, fide Bentham Fl. Australia 7 : 469.